grains. In the round pea are large potato-shaped grains (*p* grains), while the wrinkled pea has compound grains (*c* grains), averaging six parts to a grain. In addition, both types possess a few very small circular grains and in the wrinkl d pea are found occasional *p* grains, though these are very rare. In the hybrid F_1 the starch grains are perfectly intermediate between those of the parents, although the character roundness is dominant. The majority of the grains in F_1 are large and round; some, however, are compound, averaging three parts to a grain. Heterozygotes (DR) in the F_5 were of a similar sort, but extracted wrinkled peas in F_5 showed an occasional *p* grain. DARBISHIRE concludes that round differ from wrinkled peas in four pairs of characters: (1) the shape of the pea, (2) its absorptive capacity for water, (3) the shape of the starch grain, and (4) the constitution of the starch grain, i. e., whether single or compound.

In a more recent paper the author tests the theory of ancestral contributions as applied to Mendelian heredity. Yellow and green peas obtained from India, Canada, China, Russia, and other sources gave similar results. The recessive character appearing in F_5 was shown to behave as though it was as pure as that borne by a pure race. It was concluded that "there is nothing like ancestral contributions within the limits of a single unit character," and that in such cases in predicting the results of a cross, "the somatic characters not only of the parents and of the ancestors of the individuals mated, but of the individuals themselves, may be left out of account," expectation being based on the theory of the contents of the germ cells.—R. R. GATES.

Diversity in cotton.—Several bulletins by COOK and his associates in the Department of Agriculture[36] are not only of great commercial value in directing the activities of cotton growers, but are also of considerable interest as studies in variability and its causes, and the results of crossing. Without attempting to mention all the topics considered, one or two of them may be referred to as of special interest. The diversity found in Egyptian cotton introduced into Arizona is considered to be of four kinds: (1) diversity due to hybridization, (2) diversity due to incomplete acclimatization, (3) diversity due directly to differences in the physical environment, and (4) diversity in different parts of the same plant. Slight differences in the external conditions have large effects in the productivity of individuals by determining the production of sterile or fertile branches.

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[36] COOK, O. F., Reappearance of a primitive character in cotton hybrids. Bureau Pl. Ind., Circ. 18. pp. 11. 1908.

———, The superiority of line breeding over narrow breeding. Bureau Pl. Ind., Bull. 146. pp. 45. 1909.

———, Suppressed and intensified characters in cotton hybrids. Bureau Pl. Ind., Bull. 147. pp. 27. 1909.

COOK, O. F., MCLACHLAN, A., AND MEADE, R. M., A study of diversity in Egyptian cotton. Bureau Pl. Ind., Bull. 156. pp. 60. *pls. 6.* 1909.

COOK. O. F., Local adjustment of cotton varieties. Bureau Pl. Ind., Bull. 159. pp. 75. 1909.

It is found that when a race of cotton is introduced into a new locality it usually shows at once an epidemic of variation in many directions, many of the plants showing a large amount of deterioration. The tendency can be eradicated only by selecting from the best (unmodified) individuals in the new locality. In this manner a reasonab y constant race is finally obtained in the new locality, the process being known as local adjustment. New-place diversity is thus a phenomenon distinct from ordinary fluctuating variability, and of prime importance in connection with acclimatization. These new-place variations are not adaptations to the conditions, but are considered to be "experiments in accommodation" or as "affording the materials from which the more definitely accommodative characters may be developed." Neither are they directly impressed upon the plants by the external conditions, but much of the diversity is believed to represent "transmitted characters which have been able to come back into expression because the change of conditions has disturbed the previous adjustments that selection had established."—R. R. GATES.

Plants with HCN.—MIRANDE finds[37] that green plants which contain cyanic compounds, if subjected to the action of chloroform, ether, and other vapors that check photosynthesis, exhale a strong odor of hydrocyanic acid. He proposes therefore to use GUIGNARD'S test[38] in connection with this process to determine what plants contain such compounds. The test requires only a short time and avoids all the complicated and troublesome processes necessary for chemical analysis. Besides it seems to be more delicate and certain. Thus MIRANDE reports that the presence of hydrocyanic acid may readily be detected in *Arum maculatum*, a plant in which the existence of HCN, long in controversy, has lately been demonstrated by analysis.—C. R. B.

Geotropism and metabolism.—The only experiments which have claimed to show a direct connection between irritability and metabolism have been those of CZAPEK and BERTEL, who found that in geotropically stimulated roots there was an accumulation of reducing substance, which they identified as homogenistic acid. The precise character of this substance has been controverted. Now come GRAFE and LINSBAUER,[39] who report that in the material used by them (*Lupinus albus* and *Vicia Faba*) the absolute amount of reducing substances (character not determined) is very small and far below the values found by CZAPEK. Moreover, there was no constant difference between the stimulated and the unstimulated roots.—C. R. B.

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37 MIRANDE, M., Influence exercée par certaines vapeurs sur la cyanogénèse végétale. Procédé rapide pour la recherche des plantes à acide cyanhydrique. Compt. Rend. Acad. Sci. Paris **149**:140–142. 1909.

38 BOT. GAZETTE **43**:288. 1907.

39 GRAFE, V., AND LINSBAUER, K., Zur Kenntnis der Stoffwechseländerungen bei geotropischer Reizung. Sitzb. K. Akad. Wiss. Wien Math.-nat. Kl. **118**:907–916. 1909.